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09/447,378	11/23/1999	RYUJI NISHIKAWA	005586-20019	3746

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EXAMINER

QI, ZHI QIANG

ART UNIT PAPER NUMBER

2871

DATE MAILED: 12/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/447,378

Applicant(s)

NISHIKAWA ET AL.

Examiner

Mike Qi

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

## A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 06 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-5,10,11,15-17,19,20,24,25 and 39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 24 and 39 is/are allowed.
- 6) ☒ Claim(s) 1-5,10,11,15-17,19,20 and 25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other:

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. **Claim 25 is rejected under 35 U.S.C. 102(e) as being anticipated by US 6,097,466 (Koma).**

Claim 25, Koma discloses (col.2, line 56 – col.3, line 3; col.3, line 66 – col.6, line 43; Figs.1-2) a liquid crystal display device comprising:

- liquid crystal layer (40) is sealed between the first substrate (10) and the opposed substrate (30);
- the first substrate (10) has switching elements (TFTs) connected to gate signal lines (12L) and drain signal lines (18L), and the pixel electrodes (26) which are connected to the TFTs through contact hole and made of Al (metal) conductive material, and a vertical alignment film (28) for orienting the liquid crystal;
- the second substrate (30) has an opposing common electrode (32) which has alignment control window (34) at position overlapping with the pixel

- electrodes (26) to control the orientation of the liquid crystal and a vertical alignment film (28) for orienting the liquid crystal;
- the drain signal lines (18L) are disposed on the first substrate (10) at positions that overlap with the alignment control window (34) (see Fig.1);
  - the alignment control window (34) has a width different from the drain signal line (18L) (see the Fig.1 looks the width of the orientation control window is different from the drain line).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1-5, 10-11, 15-17 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant admitted prior art (AAPA) in view of US 6,097,466 (Koma).**

Claims 1 and 15, AAPA discloses (page 1, line 10 – page 5, line 27, page 5, lines 17-22; Figs.1-3) a structure of a conventional liquid crystal display device comprising:

- a plurality of pixel electrodes (19) and an opposing electrode (34) disposed to oppose the plurality of pixel electrodes (19) with the liquid crystal (21) therebetween;

- an orientation divider (orientation control window 36) for dividing an orientation of the liquid crystal in a single pixel into a plurality of directions (the applied voltage controls the liquid crystal molecules to incline in a plurality of orientation directions);
- a light-shielding film (32 in Fig.2 or the drain line 50 made of metal, being a conductive material, functions as a light-shielding film in Fig.3) is disposed to overlap with the boundaries of the orientation directions of the liquid crystal which are formed by the orientation divider (orientation control window 36);
- the orientation divider (36) is provided in a space region between pixels (19) and in a region other than the spacer region as shown in the Figs.1-3.

AAPA does not expressly disclose that the light-shielding film is disposed to overlap the orientation divider.

However, Koma discloses (col.3, line 66 – col.9, line 4; Fig.1-2) that the drain electrical wiring (18L) integrated with the drain electrode (18) and made of metal Al, so that the drain line (18L) would have the function for light-shielding, and the drain line (18L) is disposed overlapping the alignment control window (34), and the overlapping region would be in the region other than the space region along an extension direction of the orientation divider (the space region is a region between pixels). Koma indicates (col.8, line 47 – col.9, line 4) that with such structure can obtain the greatest aperture ratio without decreasing the aperture ratio by the TFT, the electrode wiring and the like.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange a light-shielding film overlapping the orientation divider as claimed in claims 1 and 15 for improving the aperture ratio for the display.

Claims 2 and 16, AAPA discloses (page 1, line 10 - page 5, line 27; Figs.1-3) a liquid crystal display device comprising:

- the liquid crystal (21) is sealed between the first substrate (10) and the second substrate (30) to oppose each other;
- the first substrate (10) has switching elements (TFTs 13) connected to the gate signal lines (51), the drain signal lines (50) and the pixel electrodes (19);
- the opposing electrode (34) is formed on the second substrate (30) to oppose the liquid crystal.

Claims 3-4, AAPA discloses (page 4, lines 3-25; page 2, lines 7-13; Figs.1-3) that a liquid crystal display device comprises the orientation divider (orientation control window 36) divides the orientation direction of the liquid crystal by the electric flux line produced in a slanting direction at the end of the pixel electrode (19) and the end of orientation control window (36), and that is inclined with respect to the normal line of the pixel electrode (19) and/or the opposing electrode (34); and orientation control window (36) is formed by removing ITO as an opposing electrode material in the opposing electrode (34) (forming an opening) at position to overlap the pixel electrodes (19).

Claims 5 and 17, AAPA discloses (page 5, lines 17-22; Figs.1-3) that the drain signal lines (50) are made of a light-shielding material such as metal, so that the drain signal lines (50) also functions as a light-shielding film.

Claims 10 and 19, AAPA discloses (page 3, lines 12–19; Figs.1-3) that the nematic liquid crystal (21) has a negative anisotropy of dielectric constant, and a vertical orientation film (20) is formed to cover the pixel electrodes (19).

Claims 11 and 20, AAPA discloses (page 1, line 10 – page 5, line 27, page 5, lines 17-22; Figs.1-3) a structure of a conventional liquid crystal display device comprising:

- a plurality of pixel electrodes (19) and an opposing electrode (34) disposed to oppose the plurality of pixel electrodes (19) with the liquid crystal (21) therebetween;
- an orientation divider (orientation control window 36) for dividing an orientation of the liquid crystal in a single pixel into a plurality of directions (the applied voltage control the liquid crystal molecules to incline in a plurality of orientation directions);
- the nematic liquid crystal (21) has a negative anisotropy of dielectric constant, and a vertical orientation film (20) is formed to cover the pixel electrodes (19).

AAPA does not expressly disclose the orientation divider has a width different from that of the light-shielding film and the light-shielding film overlapping the orientation divider.

However, Koma discloses (Fig.1) that the alignment control window (34) (as the orientation divider) has a width different from the drain signal line (18L) (because the drain signal line must be made of conductive material such as metal for the electrical conductivity, so that the metal also functions as a light-shielding film). The Fig1 shows

the width of the drain line (18L) is larger than the width of the orientation divider (34), so that the light would be securely shielded and decrease the light leakage, and that would be increase the display contrast.

Koma also discloses (col.3, line 66 – col.9, line 4; Fig.1-2) that the drain electrical wiring (18L) integrated with the drain electrode (18) and made of metal Al, so that the drain line (18L) would have the function for light-shielding, and the drain line (18L) is disposed overlapping the alignment control window (34), and overlapping the boundaries of the orientation directions of the liquid crystal formed by the orientation divider. Koma indicates (col.8, line 47 – col.9, line 4) that with such structure can obtain the greatest aperture ratio without decreasing the aperture by the TFT, the electrode wiring and the like.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange the width of the orientation divider is different from the width of the light-shielding film and arrange a light-shielding film overlapping the orientation divider as claimed in claims 11 and 20 for achieving more securely light shielding and improving the display contrast and aperture ratio.

***Allowable Subject Matter***

5. Claim 24 and 39 are allowed.
6. The following is a statement of reasons for the indication of allowable subject matter:



The prior art of record neither discloses nor teaches a liquid crystal display device comprising various elements, more specifically, as the following:

The drain signal lines are disposed to overlap the orientation control window's extension region along the longitudinal direction of the extension region, or in other words, a light-shielding film is disposed to overlap the orientation divider along the extension direction of the orientation divider [claims 24, 39].

The closest references AAPA, US 6,097,466 (Koma) and US 6,157,428 (Koma) disclose a structure of a liquid crystal using alignment control window to divide the orientation direction in a pixel electrode region so as to enlarge the viewing angle display, but the prior art of record do not disclose the arrangement for the alignment control window in which the drain signal lines functions as a light-shielding film is disposed to overlap the orientation divider along the extension direction of the orientation divider as shown in Fig.4 so as to increase the contrast ratio.

### ***Response to Arguments***

7. Applicant's arguments filed on Oct.6, 2003 have been fully considered but they are not persuasive.

Applicant's **only** arguments are as follows:

1) The references do not disclose the basic concept in accordance with the invention of an orientation divider and a light-blocking film in a pixel region overlap.

Examiner's responses to Applicant's **only** arguments are as follows:

1) The reference Koma (col.3, line 66 – col.9, line 4; Fig.1-2) that the drain electrical wiring (18L) integrated with the drain electrode (18) and made of metal Al, so that the drain line (18L) would have the function for light-shielding, and the drain line (18L) is disposed overlapping the alignment control window (34) as shown in Fig.1.

### ***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (703) 308-6213.

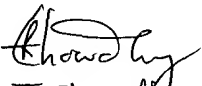
Application/Control Number: 09/447,378

Page 10

Art Unit: 2871

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Mike Qi  
December 11, 2003

  
T. Chowdhury  
Primary Examiner